

12 operating conditions being selected such that,
13 during the course of said first period of time, the
14 cathode potential is maintained above 0.66 volt and
15 cell performance decreases;

16 B. regenerating the cell after Step A by
17 a) providing a hydrogen containing fuel to the
18 anode while operating said cell using procedures
19 selected to reduce the cathode potential to below
20 0.50 volt, said procedures including the steps of
21 i) stopping the flow of oxidant to the cell and
22 replacing it with a flow of gas selected from the
23 group consisting of carbon dioxide, methane,
24 natural gas, propane, and butane, and
25 ii) disconnecting the primary electricity using
26 device from the circuit and connecting an auxiliary
27 resistive load in its place; and,
28 b) maintaining the cathode potential below the
29 said 0.50 volt for a second period of time
30 sufficient to essentially restore the cell
31 performance decrease which occurred during the
32 course of Step A; and,
33 C. sequentially repeating Steps A and B to reduce
34 the decrease in cell performance over time.

REMARKS

Claim 1 is amended to add the word “restore” that was unintentionally omitted by the Patent Office. That word was added by an examiner’s amendment during prosecution of the original patent, but the word did not appear in the issued patent.

New independent claim 10 covers an embodiment of the invention that Applicants are entitled to claim and attempted to claim in now cancelled claim 4. That embodiment is described, for example, in column 9, beginning at line 14, through Table 3 of column 10. Claim 4 of the issued patent was intended to be the same as patent claim 1, except the steps set forth in paragraph B of claim 1 were to be replaced by the steps set forth in

claim 4. By making claim 4 dependent upon claim 1, the steps of claim 4 actually added to the steps of paragraph B of claim 1, which makes no sense and was unintended. Thus, claim 4 of the original patent is in error. Claim 10 corrects the error by properly claiming the subject matter.

Dependent claim 11 is essentially the same as cancelled claim 5, except it is dependent upon new independent claim 10, rather than upon claim 4 which has been replaced by claim 10.

New independent claim 12 covers an embodiment of the invention that Applicants are entitled to claim and attempted to claim, albeit incorrectly, in now cancelled patent claim 6. That embodiment is the one described in column 11, lines 22-61 of the issued patent. That embodiment regenerates the cell, after a period of normal operation, by increasing oxygen utilization to at least 70% for a period of time. The embodiment does not involve disconnecting the primary electricity using device nor does it involve providing hydrogen to the cathode, although such limitations are set forth in patent claim 1 from which now cancelled patent claim 6 depends. The embodiment actually requires that regeneration Step B be done while hydrogen and oxygen continue to flow to the anode and cathode, respectively, and while the electricity using device remains connected across the cell. Because claim 6 is in error, the patent claims less than Applicants had a right to claim. Independent claim 12 now properly claims the embodiment in that at lines 17-22 it states that the cell is regenerated after Step A “while the primary electricity using device within the external circuit remains connected across the anode and cathode and while continuing to provide a hydrogen containing fuel to the anode and an oxygen containing oxidant to the cathode...”.

New independent claim 13 covers an embodiment of the invention that Applicants are entitled to claim and attempted to claim, albeit erroneously, in now cancelled patent claim 7, that depends from claim 1. That embodiment is the one described in column 10, lines 22-30, with an example described in column 10, line 31 through Table 4 of column 11 of the issued patent. That embodiment regenerates the cell, after a period of normal operation, by periodically increasing the current. The embodiment does not involve disconnecting the primary electricity using device nor does it involve providing hydrogen to the cathode, although those limitations are set forth in patent claim 1 from which now cancelled patent claim 7 depends. The embodiment actually requires that regeneration

Step B be done while hydrogen and oxygen continue to flow to the anode and cathode, respectively, and while the electricity using device remains connected across the cell. Because claim 7 is in error, the patent claims less than Applicants had a right to claim. Independent claim 13 now properly claims the embodiment in that at lines 17-22 it states that the cell is regenerated after Step A “while the primary electricity using device within the external circuit remains connected across the anode and cathode and while continuing to provide a hydrogen containing fuel to the anode and an oxygen containing oxidant to the cathode...”.

New independent claim 14 covers the embodiment of Applicants’ invention described in column 8, lines 12-37 of the issued patent. This embodiment is the same as the embodiment of independent patent claim 8, except in Step B, instead of “disconnecting the electricity using device from the circuit and leaving the circuit open...”, an auxiliary resistive load is connected in place of the disconnected electricity using device. Through error, this specific embodiment of Applicants’ invention was not claimed in the issued patent. Therefore, the patent claims less than the patentees had a right to claim.

New independent claim 15 covers an embodiment of Applicants’ invention described in column 3, lines 35-45 that, through error, was not specifically claimed in the issued patent. Therefore, the patent claims less than the patentees had a right to claim.

New independent claim 16 is broader than either of the two independent claims 1 and 8 of the issued patent. Claim 16 is identical to claim 1 (amended), except “battery” has been replaced with the broader term “power supply” at line 25, and Step B(a)(iii) “providing a flow of hydrogen containing gas to the cathode” has been deleted. Power supply is a term that encompasses “battery”, which is simply one type of power supply. Support for this change is found in column 5, lines 15-17, which states: “The external circuit 122A connecting the anode and cathode includes a power supply such as a battery 134 disposed in parallel to the electric load 124.” (emphasis added) Support for deleting Step B(a)(iii) is found in column 7, lines 43-51, wherein it states that if the polarity of the battery 134 (Fig. 2) is reversed, “[h]ydrogen gas would be consumed on the anode and would be evolved on the cathode. If sufficient hydrogen is evolved on the cathode, it may not be necessary to divert hydrogen from the source 111 to the cathode.” In view of the

foregoing, the issued patent claimed less than Applicants had a right to claim. New claim 16 corrects that error.

Dependent claim 17 adds back to claim 16 the Step B(a)(iii) limitation that also appears in claim 1.

Independent claim 18 is identical to issued patent claim 8, and independent claim 19 is identical to new claim 14, except, in each case, “a flow of inert gas” is replaced by “a flow of gas selected from the group consisting of carbon dioxide, methane, natural gas, propane, and butane”. Support for claims 18 and 19 (to the extent they differ from patent claim 8 and new claim 14) is clearly found in column 8 at lines 24-27 of the issued patent. Through error, these embodiments of Applicants’ invention were not specifically claimed in the issued patent. Therefore, the patent claims less than Applicants had a right to claim.

All errors set forth above were made without deceptive intent on the part of Applicants.

Examination of this reissue application and an early notice of allowance of all the claims is respectfully requested.

In compliance with 37 CFR 1.173(c), attached hereto is a statement of status and support for all changes to the claims.

Respectfully submitted,



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STATEMENT OF STATUS AND SUPPORT FOR ALL CHANGES TO THE CLAIMS
UNDER 37 CFR 1.173(C)

Claim 1 (amended) is pending. The word "restore" added to claim 1 was in originally filed (and subsequently amended) claim 1 of the original application but was omitted in the printing of the patent through error of the USPTO.

Claims 3 through 7 have been cancelled.

Claim 10 has been added and is pending. Support for this claim is found in issued patent claim 4, claim 9 of the original application filed for patent 6,399,231, and in patent column 9, beginning at line 14, through Table 3, column 10.

Claim 11 has been added and is pending. Support for this claim is found in column 9, lines 65-67.

Claim 12 has been added and is pending. Support for this claim is found in column 11, lines 22-61.

Claim 13 has been added and is pending. Support for this claim is found in column 10, beginning at line 22, through Table 4 of column 11.

Claim 14 has been added and is pending. Support for this claim is found in issued patent claim 8 coupled with column 8, lines 12-37, especially lines 31-37.

Claim 15 has been added and is pending. Support for this claim is found in column 3, lines 35-45, and column 7, lines 52-62.

Claim 16 has been added and is pending. Support for this claim is found in patent claim 1 coupled with column 5, lines 15-17 and column 7, lines 43-51.

Claim 17 has been added and is pending. Support for this claim is found in patent claim 1 coupled with column 5, lines 15-17.

Claim 18 has been added and is pending. Support for this claim is found in patent claim 8 coupled with column 8, lines 24-27.

Claim 19 has been added and is pending. Support for this claim is found in issued patent claim 8 coupled with column 8, lines 12-37, especially lines 24-27 and lines 31-37.